



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,142	10/24/2003	Steven E. Reder	03-0872	1744

24319 7590 10/27/2005
LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106
MILPITAS, CA 95035

EXAMINER

ALEXANDER, MICHAEL P

ART UNIT PAPER NUMBER

1742

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/693,142	Applicant(s) REDER ET AL.	
	Examiner Michael P. Alexander	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12 December 2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6 and 16-20, drawn to an electropolishing pad, classified in class 204, subclass 279.
- II. Claims 7-15, drawn to a method for thinning a layer on a substrate, classified in class 205, subclass 662.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used in an electroplating process or can be used in chemical mechanical polishing.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Tim Kroll on October 2005 a provisional election was made with traverse to prosecute the invention of Group II, claims 7-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-6 and 16-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7-12 and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (US 2002/0130049).

Regarding claim 7, Chen et al. teach (Fig. 13, paragraphs 0036, 0146, 0150, 0152-0155) a method for thinning a layer (1210) on a substrate without damaging a delicate layer (1215) underlying the layer to be thinned, the method comprising the step of forcing an electropolishing pad against the layer on the substrate while applying a desired voltage potential through an electrolyte solution between the substrate and the electropolishing pad, where the layer is thinned both physically by the electropolishing pad and electrolytically by the voltage potential applied through the electrolyte solution.

Regarding claim 8, Chen et al. teach (paragraph 0136) that the electrolyte solution would be an abrasive electrolyte solution.

Regarding claim 9, Chen et al. teach (paragraph 0006) that the substrate would be a semiconducting substrate including integrated circuits.

Regarding claim 10, Chen et al. teach (paragraph 0152) that the layer would comprise a first electrically conductive layer, an underlying non electrically conductive barrier layer, and an intervening electrically conductive seed layer.

Regarding claim 11, Chen et al. teach (paragraph 0035) that the layer would comprise copper.

Regarding claim 12, Chen et al. teach (0142) that the voltage would be about one tenth of one volt to about 15 volts.

Regarding claims 14-15, Chen et al. teach (0140-0141) that both the electropolishing pad and the substrate are moved relative to the other.

Claims 7, 9 and 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Duboust et al.

Regarding claim 7, Duboust et al. teach (paragraphs 0033, 0073, 0076, 0078) a method for thinning a layer on a substrate, the method comprising the step of forcing an electropolishing pad against the layer on the substrate while applying a desire voltage potential through an electrolyte solution between the substrate and the electropolishing pad, where the layer is thinned both physically by the electropolishing pad and electrolytically by the voltage potential applied through the electrolyte solution.

Still regarding claim 7, Duboust et al. inherently teach (paragraphs 0072, 0075) not damaging a delicate layer underlying the layer to be thinned because the method applies a polishing pressure of about 1.5 psi or less and removes material at 100 Angstroms per minute.

Regarding claim 9, Duboust et al. teach (0006) that the substrate would be a semiconducting substrate including integrated circuits.

Regarding claim 11, Duboust et al. teach (0073) that the layer comprises copper.

Regarding claim 12, Duboust et al. teach (0073) a voltage of about one tenth of one volt to about 15 volts.

Regarding claim 13, Duboust et al. teach (Fig. 5 and 0078) that the diameter of the electropolishing pad would be smaller than a diameter of the substrate.

Regarding claims 14-15, Duboust et al. teach (0072) are both moved relative to one another.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Alexander whose telephone number is 571-272-8558. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


mpa


ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700